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## A CONTINUOUS CENSUS OF PRODUCTION: A ROUND TABLE DISCUSSION

Editor's Note: The Committee on Business Statistics of the Association has been engaged for several months, in coöperation with various trade associations and governmental agencies, in an attempt to formulate plans for the setting up of monthly, or other frequently compiled statistics of output in key manufacturing industries. Such statistics, if available, would be of special importance, not only in the measurement of general business activity, but also as a basis for the production, sales, and financial programs of industries whose activities were directly or indirectly related to the figures compiled. The committee held an important conference on this subject in New York City in December, and the discussion was continued later in a round table meeting at the annual meeting of the American Statistical Association in Chicago. The following account, prepared for the QUARTERLY by Mr. M. C. Rorty, sets forth the substance of this round table discussion. As the result of these meetings, the committee is now undertaking to arrange for certain specific monthly compilations.

The chairman (Mr. M. C. Rorty) opened the discussion by stating that, among the persons concerned with the measurement and forecasting of business activity, whether in a broad way or for individual industries, there was a growing demand for indices of the volume, or quantity, rather than the value of production. At present, price fluctuations are so great that statistics of values, alone, are relatively useless. Statistical series, in order to be of service in measuring business activity, must be issued at short intervals, must be promptly compiled, and, for present use, must have been in existence for a long enough period to enable reasonable allowance to be made for seasonal, if not for secular, trends. The list\* that had been distributed to the members present was believed to be substantially complete as to serviceable volume indices. It would be noted that reasonably comprehensive figures were available for agricultural and mineral products, but that there was a serious lack of indices of manufacturing activity. The purpose of the present discussion was, therefore, primarily to determine what additional indices of manufacturing activity

\* Reproduced on following pages.

## A LIST OF SERIES NOW AVAILABLE SHOWING VOLUME OF PRODUCTION IN THE UNITED STATES

	Unit	Description of Series	Period	*Available Since	Issued by
<b>AGRICULTURAL PRODUCTS:</b>					
<i>Foodstuffs—</i>					
Butter . . . . .	Pound	Production storage "	Month	1917	Bureau of Markets
Cheese . . . . .	"	"	"	"	"
Eggs . . . . .	Case	Storage	"	"	"
Oleomargarine . . . . .	Pound	Production storage	"	"	"
Cattle . . . . .	Number	Number slaughtered	"	"	Annual Industry
Calves . . . . .	"	"	"	"	"
Swine . . . . .	"	"	"	"	"
Beef . . . . .	Pound	Dressed meat	"	1918	"
Veal . . . . .	"	"	"	"	"
Pork . . . . .	"	"	"	"	"
Pork . . . . .	"	Storage frozen, salt	"	1917	" Markets
Lard . . . . .	"	Storage	"	"	"
Wheat . . . . .	Bushel	Production	Year	1868	Statistical Abstract
Wheat Flour . . . . .	Barrel	Production, Stocks	Month	1910	Dept. of Agriculture
Corn . . . . .	Bushel	Production	Year	1868	Statistical Abstract
Oats . . . . .	"	"	"	"	"
Rice . . . . .	"	"	"	"	"
Barley . . . . .	"	"	"	"	"
Buckwheat . . . . .	"	"	"	"	"
Potatoes . . . . .	"	"	"	"	"
Sugar . . . . .	Pound	"	"	"	"
<i>Lumber—</i>					
Lumber . . . . .	Feet	Production Shipment Orders	Week	"	Nat. Lumber Mfrs. Assn.
New Business . . . . .	"				"
<i>Textiles—</i>					
Raw Cotton . . . . .	Bale	Production	Year	1899	Statistical Abstract of U.S. Census
Raw Cotton . . . . .	"	Consumption	Month	1917	Bureau of the Census
Spindles . . . . .	Number	Number active	"	"	"
Wool . . . . .	Pound	Consumption	"	1918	Markets
Active Machinery . . . . .	Number	Number of spindles, width of loom	"	"	the Census
<b>MINERAL PRODUCTS:</b>					
<i>Coal—</i>					
Bituminous . . . . .	Tons	Production	Week	1917	U.S. Geological Survey
Anthracite . . . . .	"	"	"	"	Anthracite Bureau of Information
Coke . . . . .	"	"	"	"	U.S. Geological Survey
Copper . . . . .	"	Production, Stocks	"	"	"
<i>Iron and Steel—</i>					
Pig Iron . . . . .	"	Production	Month	1883	American Iron and Steel Institute
Steel Ingots . . . . .	"	"	"	1901	American Iron and Steel Institute
U.S.S.C. Orders . . . . .	"	Unfilled orders	"	1910	U.S. Steel Corporation
<i>Petroleum—</i>					
Crude Petroleum . . . . .	Bbls.	Production, Stocks	"	1917	Bureau of Mines
Gasoline . . . . .	"	Total output, "	"	1918	"
Kerosene . . . . .	"	"	"	"	"
Lubricating, etc. . . . .	"	"	"	"	"

\* In the case of certain series it may be possible to secure figures for an earlier date than that here stated.

should be made available, and what procedure could best be established for setting up the necessary compilations. In this respect, the present session would be a continuation of similar discussion at the dinner of the association in New York on December 12, 1919, at which there was general agreement:

A LIST OF SERIES NOW AVAILABLE SHOWING VOLUME OF PRODUCTION IN THE  
UNITED STATES—*Concluded*

	Unit	Description of Series	Period	*Available Since	Issued by
<b>MANUFACTURED PRODUCTS:</b> <i>(Not listed above)</i>					
<b>Leather—</b>					
Hides and Skins.....	Number	Raw stocks	Month	1919	Bureau of Markets
Boots and Shoes.....	"	Production	3 Mos.	1918	Manufacturers Assn.
Stocks.....	Pounds	Stocks on hand	"	"	"
<b>Paper—</b>					
Pulp.....	Tons	Production	Month	1918	Fed. Trade Commission
Paper.....	"	Production by grades	"	"	"
Wall Paper.....	"	Production	"	"	"
Felts and Building.....	"	"	"	"	"
<b>Railroad Supplies—</b>					
Cars.....	Number	Output	"	"	Ry. Car Mfrs. Assn.
Locomotives.....	"	"	"	"	U.S. R.R. Admin.
<b>Shipbuilding—</b>					
Ships.....	Tons	Production, schedule	"	1917	U.S. Shipping Board
Ships.....	Number	Officially numbered	"	..	Bureau of Navigation
<b>Tobacco—</b>					
Cigars.....	"	Production (large and small)	Month	..	Comm. of Internal Revenue
Cigarettes.....	"	Production	"	..	"
Chewing, Smoking....	Pounds	"	"	..	"
<b>RAILROADS:</b>					
Average miles of road operated.....			Month	1917	
Net ton miles.....			"	"	
Net ton miles per mile per day.....			"	"	
Train miles.....			"	"	
Net ton miles per train mile.....		By companies and groups with totals for U.S.	"	"	U.S. Railroad Admin. Summary O.S. 5
Freight car miles (loaded empty).....			"	"	
Net ton miles per car per day.....			"	"	
Gross ton miles.....			"	"	Summary O.S. 7
Passengers carried one mile.....			"	"	Summary O.S. 8a

\*In the case of certain series it may be possible to secure figures for an earlier date than that here stated.

- (a) That there should be made available current statistics of manufacturing output in a limited number of key industries.
- (b) That the industries selected should be those of which the output can be measured accurately and readily in quantity or volume, as well as in value, and in which only a relatively small number of firms are involved.
- (c) That statistics should be set up only for those industries desirous of coöperating in the compilations.
- (d) That the statistics should be simple and that primary reliance should be placed upon statistics of shipments, supplemented by statistics of output, stocks on hand, etc., in those cases where the conditions of manufacture are such as to make the keeping of such records relatively easy.
- (e) That the compilations, to be of value, must be handled with great rapidity; *i. e.*, on a basis comparable with that of the statistics of cotton consumption now prepared by the Bureau of the Census.

The chairman further stated that, in addition to the points on which there was general agreement at the New York dinner, there was a division of opinion as to the following points:

(a) As to the series to be set up, 38 ballots were collected at the close of the dinner, which established an order of preference as follows:

Automobiles	Rubber
Agricultural implements	Typewriters
Textiles	Paper
Lumber	Cash registers
Leather	Phonographs

Additional series, not covered by the original ballot, were suggested as follows:

	Votes		Votes
Hardware (tools, etc.) . . . . .	4	Sewing machines . . . . .	1
Moving pictures . . . . .	2	Electric washing machines . .	1
Chemicals . . . . .	1	Electric vacuum cleaners . .	1
Furniture . . . . .	1	Electric farm lighting plants.	1

In addition to the above, suggestions made after the meeting included:

Sulphuric acid
Electric motors

(b) As to the agency to be employed for compilation, 27 ballots favored governmental agencies, 4 ballots favored private agencies, and 7 ballots favored combined action.

(c) As to the period, 20 ballots favored monthly statistics, 12 ballots favored quarterly statistics, and 6 expressed no choice.

Dr. Warren S. Persons, in continuing the discussion, stated that the important thing was to determine the type of information that could be obtained readily and promptly. If practicable, this should cover the output, the number of employees, with changes in wages and hours, the unfilled orders and the time required to fill such orders when working at capacity. It would especially be necessary to sell the idea of the use of such statistics. Apparently the trade associations realize their value for their own purposes, but it will be necessary to bring home to them the wider value that the figures might have if regularly published for general use. As to the industries for which compilations should first be made, it was more important to establish the method than to select any particular lines of output. Almost any three or four industries would do at the start. Special attention should also be called to the importance of setting up the indices, in the beginning, on such basis that full use might be made of the possibilities of accurate

sampling. Any attempt to await full returns from each industry would delay unduly publication of the results and would largely destroy the value of the indices as current records of industrial activity and for purposes of business forecasts. The industries involved would, of course, desire to know the total output, but this could be estimated each month from partial returns and minor corrections could be made on re-publication of the figures in succeeding months. Every effort should be made however, to maintain continuous series, using reports from the same firms each month. Supplemental reports should be used mainly for purposes of estimating total output. Variations in the number and importance of the establishments reporting should be clearly stated when the figures are published. It will be specially important in starting each series to state fully and clearly those special features of the industry and of the method of compilation employed which might affect the interpretation of the statistics. Statistics of shipments might be sufficient for some industries, but many industries stored up output during slack seasons, and this factor could not safely be neglected.

Professor Horace Secrist agreed, in general, with Dr. Persons' observations. He saw no reason for going outside of the list of key industries selected at the New York meeting. Just how many series should be set up was problematical. The necessary support for the plan could not be obtained from industrial establishments and trade associations without definite assurances that figures for individual firms would be held in confidence and that the publication of results would otherwise be properly safeguarded. Full use should be made of sampling methods, and special attention should be given to the continuity of the series. A question existed as to the possibility of getting accurate volume indices for many industries. Changing standards and grades might seriously affect the continuity of series, and much difficulty would be experienced in combining dissimilar units of output within the same industry. The storage element was also too important to be neglected. It might be desirable to use, as a supplemental index, the percentage of total capacity in operation, as revealed by the number of employees or employee hours. In some lines of output,

such as typewriters and phonographs, it might be necessary to make a distinction between output for export and output for domestic use.

The chairman stated that Professor Secrist's remarks concluded the prepared discussion, and that he would prefer to have the general discussion proceed thereafter point by point, in order that a record might more readily be made of any conclusions or differences of opinion that might develop. The plan under discussion was not at all an academic one, and if a reasonably close agreement could be reached on fundamental points, there was a very definite possibility of concrete results being obtained. First in order would be comments regarding the value of such indices as those proposed, both to business in general and to the specific industries affected.

Mr. Arthur B. Butman stated that the boot and shoe manufacturers were heartily in favor of the general plan. They particularly desired statistics as to hides and leather, but had also included provision for statistics of finished leather products in a bill now pending in Congress.

Mr. Earle Clark believed that the automobile industry, as a whole, would endorse the plan. The officers of the General Motors Corporation had expressed themselves in favor of it and Mr. Reeves, as general manager of the Automobile Chamber of Commerce, had indicated the support of that organization.

Mr. J. W. Scoville stated that the American Writing Paper Company probably would favor the setting up of statistics of paper output.

Miss Edith M. Miller felt that the banks would be particularly in favor of the plan, not only for general purposes, but also in respect to particular industries. There was much doubt as to the accuracy of existing series compiled by private agencies. Such series were much in need of investigation and test. Unfilled steel orders seemed to be affected by frequent variations in the practice with regard to the cancellation of orders. Trade practices must be definitely known before reliance could be placed on any series involving such factors.

Mr. H. N. Shenton called attention to the importance of the proposed statistics in time of actual or threatened war, or of acute industrial disturbance. Priority in transportation, coal

supply, etc., could be determined with much closer regard for the general public interest.

The chairman next called for discussion of the desirability of specific indices. There was general agreement that the industries first selected should be those comprising a relatively small number of establishments, of which the output could readily be measured in quantity or volume. It was further agreed that no attempt should be made to collect statistics from industries not generally willing to coöperate in the compilations. As to automobiles, typewriters, leather and leather products, and lumber, no special difficulties were indicated. Agricultural implements were pointed out to be subject to wide variations in seasonal and export demand. Technical difficulties as to variety of output, grades, etc., were pointed out in respect to textiles, rubber products and paper. Cash registers and phonographs were believed to promise valuable indices, but might be affected by variations in export demand, which would require special consideration. Sulphuric acid was specially favored as an index, and it was suggested that statistics for the main 60° to 66° grades would be entirely significant. Electric motors of the types used for factory drives were also believed to be deserving of consideration.

Discussion was stated to be next in order in respect to the items to appear on the schedules used in reporting output. As to this point, there was general agreement that shipments should be reported in all cases; that, where statistics of shipments were not wholly significant, they should be supplemented by statistics of output, or of consumption of some primary item of raw or semi-finished material, or of purchases of the same; that stocks on hand should be secured when practicable; that orders should be secured only when significant and when such compilation was specially desired by the industry; that labor statistics should be compiled only if desired by the industry and only in such manner as might supplement rather than duplicate the work of the Bureau of Labor Statistics; and that statistics of values should be entirely omitted.

The final discussion was with regard to the compiling agencies that should be employed.

It was agreed that, even when a governmental agency made

the compilations, it would be very desirable for the trade associations to cooperate continuously in the interpretation of the facts.

Mr. Clark believed that, while the Bureau of the Census should collect certain simple general facts regarding the whole automobile industry, the Automobile Chamber of Commerce would wish to collect more detailed facts from its own members. This point of view he thought would be held by other trade associations.

Mr. Scoville favored collection by trade associations, the Chamber of Commerce of the United States, or other non-governmental agencies. He called attention to the fact—in which the chairman concurred—that the vote at the New York meeting in favor of compilation by governmental agencies might have been reversed, if the balloting had been confined to representatives of the industries and trade associations.

Dr. Persons, while in general favoring collection by governmental agencies in cooperation with the trade associations, felt that a proper trial should be made of private agencies. He thought that the Harvard Bureau of Economic Research might be willing to undertake certain compilations.

Dr. Day emphasized the importance of obtaining the enthusiastic coöperation of the various trade associations, not only in the collection of data but also in the compilation and interpretation of the returns. He was of the opinion that sampling methods, interpretative estimation, and prompt publication—all of which had been mentioned as necessary features of the work—were more likely to be secured in a private office than in a government bureau. In view of this fact, and the prevailing attitude of business men toward the statistical work of the federal government, Dr. Day urged that every effort be made to give the various trade associations the alternative of furnishing their data to some central statistical office not under government control; such as might, for example, be set up by the Chamber of Commerce of the United States. Such rivalry as might develop between such an office and any government bureau charged with similar work for other industries would not be objectionable, but might exercise beneficial influences upon both services. Furthermore, the plan would not commit the project exclusively to either type of organization. Future

developments might be allowed to determine which form of organization promised the better statistical results.

The chairman closed the discussion by thanking the members present, on behalf of the Committee on Business Statistics, for the many helpful and constructive suggestions received. In the light of the information now at hand, he believed that the committee could undertake to secure the establishment of a few new and important indices of manufacturing output. It apparently would be desirable to divide these between governmental and non-governmental compiling agencies, being guided in this respect wholly by the desires of the industries affected. The number of new indices should be restricted to those in connection with which the most accurate results and the fullest industrial cooperation could be secured.